Emissions Processing using the Sparse-Matrix Kernel Emissions Modeling System (SMOKE)

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SMOKE

- Developed by MCNC-North Carolina Supercomputing Center.
- Primarily emissions processing system.
- Provides specialized inputs for air quality models: gridded hourly 3-d emissions.
- Area, mobile, point emissions processing.
- Biogenic emissions modeling.

SMOKE Processing Steps

- Spatial allocation of county emissions.
- Temporal allocation of daily or annual inventory data.
- Chemical speciation of inventory pollutants (NO_r in NO and NO_2).
- Temporal projection.
- Controls.

SMOKE Episode

- June 4-7, 2002 & July 10-13, 2002.
- 6 km x 6 km modeling domain, 89 columns and 59 rows.

SMOKE Input Data

Emissions Inventory

Western Regional Air Partnership (WRAP)
1996 Base Case Scenario
County data for area, mobile and point source emissions
Inventory species: NO_x CO NH_3 SO_2 VOC

Meteorological Data

MM5 simulation results for episode days June 4-7, 2002 & July 10-13, 2002

SMOKE Input Data

Land Use Data

U.S. EPA's Biogenic Emissions Landcover Database (BELD3),1 km x 1km resolution, 230 land use types
ftp://ftp.epa.gov/amd/asmd/beld3

Spatial Surrogate Data

U.S. EPA's 4km Spatial Surrogate Data covering the United States
http://www.epa.gov/ttn/chief/emch/spatial/

Spatial Surrogate Codes

- Agriculture
- Airports
- Land Area
- Housing
- Major Highways
- Population
- Ports
- Railroads
- Water Area
- Urban Area
- Rural Area
- Forest Area
- Urban Primary Roads
- Rural Primary Roads
- Urban Secondary Rds.
- Rural Secondary Rds.
- Urban Population
- Rural Population

Smoke Results